An ecological problem

1. Suggest reasons for using pitfall traps to capture honey possums in preference to other trapping and baiting techniques.

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2. Why do researchers need to use so many traps, typically 100 per study site grid?

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3. Why must pitfall traps be cleared at dawn?

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4. A researcher captures 63 animals from their study area, which consists of four study site grids, each with 150 traps that were open for three nights. What is the trap success rate?

- The following questions are based on data in Tables 1, 2 and 3 in the fact sheet, *Pitfall trapping*.

5. Consider the data in Table 1: Flowering times of plants most often visited by honey possums.

   (a) What can you say about food availability over the year?

   (b) Are there any species that appear to be more important to the honey possum than others? Explain.

   (c) How would a decline in abundance of *Banksia* species, due to dieback infection, affect the honey possum's food availability?

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6. Consider the data in Table 2: Mean monthly rainfall (mm) for research area 1994 – 2004.

   (a) Is there any clear pattern of rainfall over the study period?

   (b) Which years displayed the highest and lowest mean rainfall?

(c) What effect might this have on the spread of dieback and food availability within the study grids?

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7. (a) Use the information provided in Table 3: Honey possum captures for study site 1994 – 2004 to calculate trap success rate (TSR) for each season over the study period.

(b) Display the seasonal TSR results in an appropriate graphical form.

(c) Do these data show any distinct patterns? Explain.

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8. (a) Calculate TSR for grids A, B and C over the study period.

(b) Display the calculated TSR in an appropriate graphical form.

(c) What patterns are revealed here that are not evident in the seasonal TSR graph?

(d) Can you relate these results to flowering times and/or rainfall data? Explain.

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9. (a) Answer the research question: 'Has the outbreak of dieback had an adverse effect on the honey possum population within the national park?'

(b) What other factors may have contributed? Explain.

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10. What do you expect might happen to an ecosystem if natural processes such as pollination and plant regeneration are disrupted?

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11. What further investigations or changes to the methodology would you recommend? Why?

Extension activity

When food supply is plentiful, honey possums are able to breed up to four times a year. They produce small litters of two to four joeys, which are carried in the pouch until they are almost weaned, rather than being left in a nest. These characteristics of reproduction require an increased amount of energy and time, which may require breeding honey possums to harvest nectar from more nutritionally rewarding flowers.

The data displayed in Table 4 represent the same total number of honey possums as Table 3, however it has been presented in a different way.

1. How do these tables differ, and what extra information is given in Table 4?
2. Using the same procedure as the previous activity, determine whether dieback has had an effect on the reproductive success of the honey possum population in the study area. Explain your results.